A USER'S GUIDE TO THE KENTUCKY PORTABRAILLE AND POCKETBRAILLE

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INTRODUCTION

This user's guide is intended as a preliminary text. From the response we have received to announcements of the PortaBraille and PocketBraille, we believe that users will have much to say about features they would like to see added to or dropped from the devices. This user's guide is intended to tell readers what the PortaBraille and PocketBraille can do at the time of release. We invite user comment and ask that it be addressed to the Technical Services Unit, Kentucky Department for the Blind, 427 Versailles Road, Frankfort, Kentucky 40601. Our telephone number is (502) 564-4754.

IMPORTANT INFORMATION!

In this guide we will be discussing both the PortaBraille and PocketBraille. Unless otherwise specified, we use the term "PortaBraille" to include both devices.

The PortaBraille uses a braille display which contains 120 pins which pop up to form as many as 20 cells of braille. It is vital that your hands are clean and free of excess oils when you read the braille display.

Most people who read manuals either skim through them or don't read them at all. We recommend that you read through this manual at least once in order to learn what it contains and where things are hidden. There are some points you really should know about. Failure to observe them could cause you to damage your instrument and/or loose valuable data stored in it. PLEASE BE SURE TO READ the sections dealing with batteries, output port selection, the appending of linefeeds in transmit mode, cursor moves, duplex, display of carriage returns and control (CTRL) characters, and Window Options choice V.

This is a preliminary text. The systems being described here have not had wide field testing. If you have problems we would like to know about them. Try to be as specific and detailed in reporting problems as you can and we will make every effort to correct such unfortunate conditions.

Southland Manufacturing Company of Lexington, Kentucky, maker of the printed circuit boards used in both the PortaBraille and PocketBraille, intends to sell at manufacturer's cost, completely assembled and tested PortaBraille and PocketBraille units. The goal is to have them available in January of 1986.

A complete kit of parts may also become available from Southland. This also would be sold at their cost.

Contact the Kentucky Department for the Blind for details.

The print edition of this manual is being sent to everyone who requests a construction manual. This manual also is available in braille and cassette recorded form. For details, contact the Kentucky Department for the blind.

DESCRIPTION OF PORTABRAILLE

The PortaBraille measures about eight inches wide, six inches deep and two-and-a-half inches thick. Place the instrument on a table with its four rubber "feet" down. The back panel, the one with the projections, should face away from you.

If you lift upward on the front portion of the cover, it will swing up and away from you. This will reveal the PortaBraille keyboard. It is a seven key

board much like that of a braillewriter. The larger key in the center is the space bar. Keys for dots 1, 2 and 3 are to the left and for dots 4, 5 and 6 are to the right of the space bar.

The PortaBraille has a 20-cell braille display. This display is between the keyboard and the front of the instrument. When the display is active, a short voltage pulse energizes the pins which form braille dots, causing them to pop up and latch in place. There they will remain until another voltage pulse releases them. If you turn the power off with pins raised, they will stay raised.

Your first step in operating the PortaBraille is to turn on the power. To locate the power on/off switch, place a finger on the key for dot 6, the right most key on the keyboard. Slide your finger to the right so that it touches both the rounded top of the key and the right edge of the square base on which this top rests. Now, gently move your finger toward the rear of the PortaBraille gradually turning the tip of your finger in a leftward direction around the corner of the square key platform. Just behind the rear edge of the square key platform is the on/off switch. Its handle points upward toward the under side of the PortaBraille cover. Moving the switch to the left turns the power on and moving it back to the right turns the power off.

There is a second power related switch. Though you will not use it as often as the on/off switch, you need to know about it. It is the switch which connects or disconnects the PortaBraille's internal battery power supply.

To find this battery disconnect switch, place your right index finger on the upper edge of the lower portion of the PortaBraille case just to the right of dot 6. With your index finger in this location, point it into the PortaBraille and slightly downward. There, about an inch in from the right panel and an inch beneath the key platform for dot 6, you will feel another switch. It feels just like the power on/off switch, and is the battery connect/disconnect switch. With the switch to the left, the battery power supply is connected. Moving the switch to the right, toward the right edge of the PortaBraille case, will disconnect the battery supply. You still will be able to operate the PortaBraille from A.C. house current, but you cannot charge or use the battery with the switch in the disconnect position.

REAR PANEL FEATURES

Now, please turn the PortaBraille around so that its rear panel faces you. As you move your hand along this rear panel in a left to right direction, you will encounter two projections and a rectangular hole. The first projection is the RS232 connector. It is through this connector (port) that data will flow between the PortaBraille and external devices which use SERIAL input/output.

The second projection is the PARALLEL input/output port. This is the port to use when parallel data transfer is employed.

The rectangular hole in the lower right corner of the panel is the entry point for the power cord used to connect the PortaBraille's combination a.c. house current power supply and battery charger to house current.

Those are all the controls and connection points for the PortaBraille.

DESCRIPTION OF POCKETBRAILLE

The PocketBraille measures about eight inches wide, five inches deep and one inch thick. Place the instrument on a table with its four rubber "feet" down. The back panel, the one with the projections, should face away from you.

Place the thumb of one hand against the narrow front panel of the PocketBraille case. Place the index and middle fingers of the same hand against the narrow rear panel. With your other hand, lift upward on the near edge of the cover of the case. It will swing up and away from you. This will reveal the PocketBraille keyboard. It is a seven key board much like that of a braillewriter. The larger key in the center is the space bar. Keys for dots 1, 2 and 3 are to the left and for dots 4, 5 and 6 are to the right of the space bar.

Your first step in operating the PocketBraille is to turn on the power. To locate the power on/off switch, place a finger on the key for dot 6, the right most key on the keyboard. Slide your finger over the round top of the key and downward over the rear edge of the square key platform. The tip of your finger will contact the upward pointing handle of the power on/off switch. When this switch is in the left position, the power is turned on. Moving it to the right turns the power off.

The major difference between the PocketBraille and the PortaBraille is that the PocketBraille has no braille display. It is intended as a "write only" device. Data in its text memory can be transferred to an external computer for editing and storage, or to a speech synthesizer for reading and editing.

REAR PANEL FEATURES

Now, please turn the PocketBraille around so that its rear panel faces you. As you move your hand along this rear panel in a left to right direction, you will encounter something that feels like the earphone jack on a tape recorder or transistor radio and two projections. That which feels like an earphone jack really is the jack into which you plug the PocketBraille's battery charger. The first projection is the RS232 connector. It is through this connector (port) that data will flow between the PocketBraille and external devices which use SERIAL input/output.

The second projection is the PARALLEL input/output port. This is the port to use when parallel data transfer is employed. Those are all the controls and connections for the PocketBraille. Now we need to get down to the business of actually learning to use these two instruments.

WRITING AND ISSUING COMMANDS

When you turn the PortaBraille on by sliding the on/off switch to the left, you will hear something which sounds like a row of dominos falling. This is the system clearing the braille display window and preparing to receive your commands. It also lets you know that it has accepted power. If you do not hear this sound when the power is switched on, something is wrong.

When you turn on the PocketBraille, if you listen carefully you will hear a very high pitched but faint chirp. Since the PocketBraille has no display window to clear, this chirp signal lets you know that the unit is taking power. When the PocketBraille is turned on, this faint chirp signal will occur each time you press a key. Having turned our instrument on, we are ready to issue commands. When we write with either instrument we are able to use any kind of braille we like: grades 1, 2 or 3, music, foreign languages, mathematics notation, etc. If we print out our braille keyboard entries in

braille, what we put in is what we will get out. If we want our data to be printed out in ink, we need to write in "COMPUTER BRAILLE". In computer braille, the letters from a to z are as you already know them. Numbers 1 through 0 are written in the four lower dots of the braille cell. The number sign is not used. Punctuations differ from those used in literary braille but they are easy to learn. A complete listing of the computer braille character set is the last section of this guide.

When you issue commands, you must issue them in computer braille. This should cause you no problem, but where the comma and numbers are required take special care until you become familiar with the computer braille system.

This guide contains a list of the commands which the PortaBraille and PocketBraille will recognize. The list occurs twice. In the first listing, when it seems appropriate to do so, we have followed each command or set of related commands with discussion of its use, its effect and any cautions bearing upon it. This first listing is divided into three categories. First, we treat READING/WRITING commands. These are the ones you will need to use in writing with either instrument and in reading back what you have written. This is true whether you use the instrument as a stand-alone unit, or connected to an external device.

The second category is for COMMUNICATION commands. You will need to know how to issue them when using either instrument with certain printers, computers, modems, speech synthesizers etc. Immediately following this section you will find "INTERFACING INFORMATION". There, you will find information about cable requirements need for communication between the PortaBraille or PocketBraille and external devices.

Finally, OTHER commands treat those which might fit in either of the first two categories but are not necessarily the exclusive property of either. A few have little or nothing to do with either category, so that OTHER is a catch-all.

The second command listing contains the commands again in alphabetic order, but without comment. It is intended as a quick reference but is not a substitute for the careful study of the first list. Some of the commands which can be issued from the PortaBraille or PocketBraille keyboard also can be issued from an external device such as a computer, external keyboard, etc. This is done through the use of "escape sequences". The command summary list also contains a list of those escape sequences recognized by the PortaBraille.

The COMMAND SUMMARY ends with a listing of all the DEFAULT values (conditions which exist when the power is turned on).

In most commands, we speak of a "chord". This means that the braille keys which represent the letter or other character which is "chorded" are to be pressed and released along with the space bar. The FIND command begins with F-chord. This means that to begin a "find" operation, you must press dots 1, 2, 4 and the space bar at the same time. The elements of a command are entered without separation by spaces. Thus, to delete a word, enter the three element command D-chord W E-chord but without spaces between any of the elements.

When you receive your PortaBraille or PocketBraille, no doubt the first thing you will want to do is write something and read it back. With the PocketBraille, it will be necessary to connect the device to an external computer, printer or speech synthesizer, since it has no display window of its

own. Still, the procedure for writing and moving through the text stored in the 56K memory of either device is essentially the same.

First, make sure your instrument's batteries are charged fully, or use A. C. house current. (See the section on BATTERIES.) Then, turn the power on. With the PortaBraille, you will hear the "domino rattle" mentioned earlier. With the PocketBraille, you should hear the faint chirp mentioned earlier. Now, begin writing just as you would on a braillewriter. Each time you press a PortaBraille key you will hear a click. The braille character you wrote will appear on the 20-cell braille display between the keyboard and the front of the machine.

After you have written 20 characters the clicking will stop. No, the PortaBraille is not broken. Instead, the display window is full and the characters you continue to write are going into the memory of the device without being displayed.

It is possible to set the display window so that it will follow along as you write. This will allow you to look at the last character you have written. Doing this consumes considerably more battery power than simply writing without "scrolling" the display window.

If you write in memory without having the display window follow along, when you have finished, you may read what you have written by advancing the "window" one display at a time. You may scan by checking the start of each new line or move the window forward one paragraph at a time. (A line is defined as any block of text bounded by single carriage returns or carriage return linefeed combination. A paragraph is defined as having boundaries of two consecutive carriage returns or carriage return linefeed combinations.) You even can leap forward by a number of lines. You can leap to the very end of your text, the "electronic page" on which you are writing. What you can do in a forward direction, you also can do in reverse.

As I write these lines I seem to hear a chorus of voices demanding "Yes, but how can you do all these things?" The rest of this guide is intended to answer this very question. Before you do much with your instrument, you need to know about the care and feeding of its battery power supply.

THE BATTERY POWER SUPPLY

The PortaBraille's battery pack consists of 24 size AA fast charge nickel cadmium (NICAD) cells. The way you use and care for this power supply can affect both the length of its life and its ability to hold a charge. For best performance, do your best to stay with the guidelines presented here.

The hours of use you can get from a PortaBraille with a fully charged battery pack depend almost entirely on how much you use the braille display window. The "SELF TEST" displays a new line of braille every four seconds. Placing the PortaBraille in this mode with a fully charged battery pack would give you about ten hours of service. In normal use you would not be exercising the display window that much. Therefore, you probably can count on many more hours of normal operation. If very little use were made of the display window, you could leave the PortaBraille turned on for several weeks and still have its text memory in tact. After this length of time, the PortaBraille might be operable even though the batteries might be too weak to drive the braille display.

Whenever the PortaBraille is not actively processing data, it automatically

enters a "power down stand by" mode and consumes very little power while awaiting your next command or more incomming data. When not in use, NICAD batteries still lose about 1 percent of their charge per day at room temperature. This is due to self discharge.

Here is what you need to do to obtain optimum performance and life from the battery pack:

1. Charge the batteries using the A. C. line cord for eight hours. When you do this, the PortaBraille should be turned off and the battery connect/disconnect switch should be on. NOTE: When the PortaBraille batteries are being charged, if you place your ear against the bottom of the PortaBraille case you will be able to hear a faint hum. After an hour or so in the charging state, the bottom of the case will feel warm to the touch.

2. Remove the line cord and use the PortaBraille only on battery power until the batteries are discharged fully. This condition will be indicated by weak dots which increase both in number and frequency. Further, the movement of the braille display window will seem weak.

3. Repeat the above steps.

Of course, this procedure is fairly restrictive. Next we will tell you of some deviation from it which you may want to follow at times. The steps we have just given make for ideal recharge/discharge conditions as recommended by NICAD battery manufacturers. Here are some additional suggestions. These deviations are useful and, at times, unavoidable.

If you plan to power the PortaBraille from A.C. power for an extended period of time, turn off the battery connect/disconnect switch

If the batteries need recharging at a time when you need to use the PortaBrailIle, you may do both at the same time.

Wherever possible, wait until batteries become fully discharged before recharging. To do otherwise may reduce their charge capacity. Batteries are considered fully discharged when they no longer operate the braille display reliably. It is at this point that you should recharge them.

You should remove the charging current from the batteries at the end of the recommended charging time. However AN OCCASIONAL overcharge of several hours beyond this time should cause no problem.

Be careful not to store the PortaBraille away in the "turned on" condition using battery power for a momth or more. Doing this could damage the batteries due to too great a discharge.

If the display window becomes weak due to low batteries in the middle of a work session, you may plug in the A. C. line cord without turning off the PortaBraille. This will reestablish full power for the display without disturbing the data in the text memory. Any stored data are gone forever when the PortaBraille is turned off.

Except that the PocketBraille has no display, the information just given applies to it as well as to the PortaBraille. However, the PocketBraille uses only two batteries. These are nine volt fast charge NICADs which can be recharged fully in four hours. If your PocketBraille does not use the fast charge batteries, minimum charging time is 14 hours.

Instead of an A. C. line cord, the PocketBraille is charged with a 30-volt A. C. wall adapter. It is terminated with a sub-mini-phone plug which plugs into the power jack on the back of the PocketBraille as described earlier.

With heavy keyboard and/or input/output usage, a full charge will last about ten hours. With light keyboard or input/output usage, the PocketBraille will remain "powered up" for several days.

COMMANDS AND HOW TO USE THEM

In the text which follows, the letters "ctrl" stand for the "control character". [Y, N] means "yes, no". When "Y" or "N" is part of a command it is entered and not the word "YES" or "NO".

READING/WRITING COMMANDS

APPEND: always active appends data to end of text unless in insert mode

Unless you are in the INSERT mode, as you write on the PortaBraille or PocketBraille, that which you write always is written at the end of current text in memory. In other words, if you had a letter from a friend stored in the PortaBraille and were reading it, you could answer it at the same time without destroying the stored letter. Your reply simply would begin right after the end of your friend's letter.

BACKSPACE dot 2-chord

As you write, if you know you have just made an error, use the backspace to remove the incorrect character and enter the correct one. Those characters over which you may have had to backspace will be gone. Like the APPEND feature, the backspace works from the end of your text. If you are reading somewhere in midtext and find an error, you will need to use the DELETE and/or INSERT function to correct it.

CARRIAGE RETURN/LINEFEED PAIR: dots 46-chord

Using this command is like pressing the carriage return key on a typewriter. It causes a carriage return character (CTRL M) and a linefeed character (CTRL J) to be placed in your text. Because the text window can be moved to the next or previous line, the use of the carriage return or carriage return/linefeed pair can be helpful in marking the ends of notes, messages for others, or other blocks of text through which you might want to move quickly or whose boundaries you want to locate in a hurry.

CARRIAGE RETURNS DISPLAY AS: G-chord [S, F, 4, N]
S = spaces, F = full cell, 4 = dot 4, N = do not display

Normally, a carriage return is evidenced by the fact that the next block of text begins at a left margin. Since reading the PortaBraille's text window is rather like reading a long strip of narrow tape, this option allows you to examine documents to determine just where new lines begin. To computer programmers, it can be useful to see carriage returns. Depending on the kind of text with which you are working, having more than one way of displaying a carriage return could be of value. Normally, carriage return characters are displayed as spaces. To be able to distinguish them from spaces or other CTRL characters which also are displayed as spaces, you must invoke the G-chord followed by the appropriate display option.

CTRL CHARACTER FOLLOWS: dot 4-chord

Using a standard computer keyboard, to send a CTRL character you would hold down the CTRL key as if it were a shift key - which it is. However, since these braille devices have only seven keys and there is no CTRL key to hold down, this command still gives you the ability to send CTRL characters when necessary. For example, the "bell" signal is the CTRL G. Sending it to an external terminal or computer will cause the warning signal (bell) in the remote device to sound. To send a CTRL-G simply enter a dot 4-chord followed by the letter G.

NOTE: In issuing control characters or commands involving chords, even though the associated letter may be shown as uppercase, it is not necessary to enter the appropriate U-chord command.

CTRL CHARACTERS OTHER THAN CARRIAGE RETURNS DISPLAY AS SPACES: M-chord [Y, N]

As in the case of carriage returns, there are times when it is useful to know where CTRL characters are. This is especially true when it comes to deleting characters. So, this option gives you that information. Later we will tell you of a command which will identify the specific CTRL character.

DELETE: D-chord [C, W, L, P, Z] followed by up to a three digit number (255 max) terminated by an E-chord
C = character, W = word, L = line, P = paragraph, Z = all from current window cursor location to end of text

All deletions take place from wherever the window cursor happens to be at the time the command is issued. Thus, to delete three characters, words, lines, etc., you must first be sure that your window cursor is on the exact starting point from which you intend the deleting to begin.

CAUTION: Normally, CTRL characters other than carriage returns are displayed as spaces. However, it is possible to turn this option off. If you do have it off and want to count characters for purposes of deleting them, even though you are not displaying the presence of these CTRL characters, the PortaBrailleSystems will count them as characters. Thus, it may appear to you that you have deleted fewer characters than you intended.

Further, if you want to delete an entire line, remember that your window cursor must be at the very beginning of the line. Otherwise only that portion of the line from the point of the cursor onward will be deleted.

The system interprets spaces, tabs, carriage returns, linefeeds and formfeeds as word delimiters (boundaries). Any punctuation marks contained between a word and the boundary which follows it will be considered a part of the word and deleted along with it. If a word is connected to text which follows it by means of a slash or dash [/-], deleting the word will also cause the connecting mark and the first word in the following text to be deleted along with it. If you want to delete a word, be sure that the window cursor is on the first character of the word AND NOT on the space to its left. Since the space is a word delimiter, placing the cursor on a space and then deleting a single word will only delete that single space.

The system defines a line as a block of text bounded by single carriage returns, or single carriage return/linefeed pairs.

Paragraphs are bounded by double carriage returns or double carriage return/linefeed pairs. If no number is used in connection with the command, the system assigns a value of 1. Thus, D-chord C E-chord would result in the deletion of one character.

FIND: F-chord string (up to a maximum of 255 characters) E-chord

The FIND command is the one you will use to take you quickly FORWARD to any portion of your text memory. The actual search begins with the first character beyond the current location of the window cursor. This command does not work in a backward (left) direction. So, if you want to search the entire text for a given set of characters, start the FIND operation by moving the window to the beginning of your text. Enter the F-chord. The text window will clear. Write in the string of characters for which you are searching and finish the operation with an E-chord. If the search is successful, the window will show at least the first 20 characters of the set of characters sought by you. The window cursor will be UPON the first character of the set. You must write the set of characters for which you are searching EXACTLY AS THEY APPEARED in the text except for upper and lowercase. If the character string for which you are searching is not found, the message "not found" appears in the text window. Tap any key to remove the message and return the display window to "normal". When you are using the FIND or INSERT option, the text window "scrolls"; it follows you as you write. This allows you to see what you are writing so you can tell if you have made an error in entering your find or insert character string. If you are using the FIND command in preparation for inserting or deleting text, FIND will bring you close to your goal. Probably, you will need to use the MOVE WINDOW CURSOR command to reach your goal with precision.

CAUTION! Never use the FIND or INSERT commands when data are being transmitted to the PortaBraille or PocketBraille from an external source. If you do, the incoming data will become a part of the FIND or INSERT character strings and create chaos.

FIND INCLUDING CASE: dots 2346-chord [N, Y]

There are times when a search for a set of characters can be made more efficient if you know whether the string of characters you want to find is in upper, lower or mixed case. This command allows you to include case as a part of the string for which you are searching. Thus, if key words are in uppercase you can search for them while ignoring those same words if they appear in lowercase. You still must use the FIND command, but "FIND INCLUDING CASE" enables you to include upper, lower, or mixed case as a part of your search. (See the commands associated with uppercase for information about writing single characters or locking the system in uppercase.)

INSERT: I-chord text E-chord
(255 characters max) (backspace allowed in insert for immediate correction)

To insert up to 255 characters, place the window cursor on the first character which will need to be moved to the right (forward) by the insertion. Enter I-chord. The window will clear. Type in the material you are inserting. Finish with an E-chord. If you need to insert more than 255 characters, when you attempt to enter the 256th, you will hear the "domino" sound. The 255 characters you had entered will have been inserted automatically and the system will have "reset" itself to normal (non-insert) operation. You will need to issue the INSERT command again. When you are in INSERT or FIND option, the text window "scrolls"; it follows along as you

write enabling you to see exactly what you are writing for purposes of error correction.

CAUTION! Never use the INSERT or FIND commands when data are being transmitted to the PortaBraille or PocketBraille from an external source. If you do, the incoming data will become a part of the INSERT or FIND character strings and create chaos.

MOVE WINDOW CURSOR TO RIGHT ONE CHARACTER: dot 5-chord

MOVE WINDOW CURSOR TO LEFT ONE CHARACTER: dots 45-chord

These first two MOVE commands move the window cursor WITHIN THE 20-cell WINDOW, but not the window itself. Normally, the window cursor is UPON THE CHARACTER IN CELL 1 of the window but invisable "untouchable" if you like. Entering a dot 5-chord does two things. First, it moves the cursor to the right one character position (cell). Second, it makes it touchable in the form of a full six-dot cell. Using the MOVE WINDOW CURSOR LEFT (dots 4-5), you can return it to cell one of the window. The cursor is free to move wherever you like using these commands but only within the confines of the 20-cell window. Having moved the window cursor to the right to cell 20, or left to cell 1, continuing to press the appropriate window cursor move chord will do nothing. To get the window cursor "out of the box" you will need to use one of the MOVE WINDOW commands. Whichever way you move the window, the window cursor location will reset to cell 1 of the new text window and become invisable again. Think of such an operation as a WINDOW CURSOR RESET.

MOVE WINDOW TO NEXT DISPLAY: dot 6-chord
TO NEXT LINE: dots 56-chord
TO NEXT PARAGRAPH: dots 456-chord
TO END OF TEXT: Z-chord

MOVE WINDOW TO PREVIOUS DISPLAY: dot 3-chord
TO PREVIOUS LINE: dots 23-chord
TO PREVIOUS PARAGRAPH: dots 123-chord
TO BEGINNING OF TEXT: A-chord

In case it has escaped your notice, all of the MOVE WINDOW commands just given follow a certain logic. It is intended to make learning and remembering the commands easy. As the forward moves increase in length, one more dot is added to the move-chord and it is on the right half of the keyboard. Leftward moves, at the left of the keyboard, operate in a similar way. The expression "from A to Z" usually means from start to finish. In this case, it means from beginning to end of text.

These move capabilities make reading and skimming through text easier. If all notes on a given topic are separated by single carriage returns, one can move from one note to the next within the topic with a MOVE WINDOW TO NEXT LINE command. If a double carriage return is used to mark a change of topic, moving by paragraphs can move the window from one topic to the next quickly.

MOVE WINDOW FORWARD OR BACK n LINES: #-chord + or - n E-chord
n = number of lines, up to 255; - before the number moves back, no indicator or a plus sign moves forward

This command allows you to move the window forward or backward a number of lines which you specify. This command can be useful in examining the contents of a screenful of data which you may have received from a computer.

SCREEN SELECT: dots 16-chord [I, R, 8, 4]
I= IBM PC, R = Radio Shack Model 100, 8 = Apple computer with PRINT-IT! card (80 column mode) 4 = Apple computer with PRINT-IT! card (40 column left justified mode)

For details about the use of this command, see the following information about the Radio Shack Model 100.

The Radio Shack Model 100 mode (choice R) allows you to examine the screen of this lap computer in cell mode. This was the first device for which this feature was added, but the information contained here applies to the other devices covered by this command. Because the Model 100 contains a 40-cell per line screen, each PortaBraille window contains exactly half of a screen line. Pressing the "PRINT" button on the Model 100 sends the entire contents of the screen out the parallel port for ink printing. Using the PortaBraille, we take advantage of this condition. Some internal calculation and character counting has to be done by the PortaBraille's processor in order to make the character count come out right for our purposes. Thus, when we "look" at the screen of the Model 100 with the PortaBraille, our first window contains the left half of screen line 1. The next display gives us the right half of line 1. The next display takes us to the left half of line 2 and so on. It may help you to keep your place by remembering this: with a 40-space screen, the very first PortaBraille display window after transmitting the screen to the PortaBraille gives you line 1, half A. Each time you advance the window to the next display you go to the next half line; 1B, 2A, 2B, 3A, etc. If you are working with a computer having an 80-space screen line, such as the IBM PC,each PortaBraille window is one fourth of a line; 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D etc. If you advance the display window to the next line rather than the next display, you will be looking at segment A of each new line. This makes editing text which is done in the Model 100, or any other selected computer, a bit easier. Before trying to do this, you should be thoroughly familiar with the operation of the computer whose screen you have selected. Also, keep in mind that each time the host computer "dumps" a new screen to the PortaBraille, the PortaBraille's text memory is cleared of other data and given the latest screenful of data. Thus, at any given time during a screen examination session, only one screenful of data, the most recently sent screen, will exist in the PortaBraille's text memory.

Using the PRINT-IT! card in the 40 column left justified mode, you must press the "print button" of the PRINT-IT! card followed by the letter L from the keyboard of your Apple computer, followed by a carriage return. This will result in a proper screen print to the PortaBraille or PocketBraille.

SHOW WINDOW WITH CTRL CHARACTERS: R-chord C

As mentioned earlier, a CTRL key is a key which functions as a kind of shift key on a computer keyboard. Within the set of characters used for the ASCII code used by computers for communication, all the letters of the alphabet and six other characters when shifted into the CTRL register, bIecome CTRL (control) characters. The carriage return character is a CTRL M. If you use the command under discussion, the window rearranges itself. All non-CTRL characters are replaced with dashes and the alphabetic representation of the CTRL character is shown in its appropriate place. Thus a carriage return (CTRL M) appears as an M. A linefeed character (CTRL J) is shown as a J. A carriage return/linefeed pair would appear as "MJ". Tap any key to return the window to normal.

In communication with computer networks, there are times when the network sends a CTRL-G to ring the bell of a terminal. Usually, this is done to indicate the presence of a special message. Since the PortaBraille systems have no bell, using the FIND command and looking for a CTRL-G would disclose the presence of such a character. If CTRL characters are being displayed as spaces, the result of the search for a CTRL-G would be to place the window cursor on a blank space. Invoking the R-chord C command would cause the letter G to appear in the space. Immediately to its right would be the start of the special message. To "FIND" a CTRL-G, you would enter F-chord dot 4-chord G E-chord.

SHOW WINDOW WITH FIRMWARE VERSION NUMBER: V-chord

Firmware is the set of instructions which tells your PortaBraille or PocketBraille which commands to recognize and how to obey them. "Firmware" differs from "software" in that software is a program or set of programs loaded into a system from an external medium such as disk or tape. Firmware is an integral part of the system and is written into "read only memory" (ROM) one of the "chips" contained in the device for which it is written.

As changes are made in these instructions because of discovered bugs, new features, etc., firmware is changed. Therefore, in reporting a problem or discussing the behavior of your system, it is important to be able to know which version of the firmware you have. To see this number (it is like a model number or an edition number), simply issue the above command. The display will show "version #" and a number such as "version #1.29". Tap any key to return the window to normal.

SHOW WINDOW WITH FREE MEMORY: dots 156-chord

When you invoke this option, two numbers appear in the window. The first is the location of the window cursor. The second tells how many character spaces are left in your text memory; the amount of room you have left for writing. A comma separates these items. Tap any key to return the window to text display.

SHOW WINDOW WITH UPPERCASE CHARACTERS: R-chord U

As with the R-chord C command, using this one causes the window to be rearranged. Lowercase characters are replaced with dashes and uppercase characters retain their braille dot patterns. Tap any key to return the window to normal.

UPPERCASE--LOCK ON: U-chord U-chord

In the default (power on) condition, the PortaBraille and PocketBraille write in lowercase. This command is used to lock writing into uppercase. Having issued the command, all characters which follow are in uppercase until the system is returned to lowercase with a Q-chord or until the power is turned off.

UPPERCASE--UNLOCK: Q-chord

UPPERCASE--NEXT CHARACTER ONLY: U-chord

This command functions as the shift key on a typewriter. The first character following the command is written in uppercase and the system immediately returns to the lowercase writing mode.

WINDOW OPTIONS: W-chord [C, Q, S, V, W]
C = cell, S = scroll, V = the screen which is selected, W = word, Q = column mode
to read columnar text, enter W-chord Q followed by a 1, 2 or 3 digit number, followed by a comma and another 1, 2 or 3 digit number (255 max). The command is terminated with an E-chord.

This command arranges the text window so that text can be read in five different ways.

In cell mode, (choice C), text is presented just as it has been written from the keyboard or received through one of the input ports. The only limitation is that placed on the system by the use of a 20-cell display. If you were to write the months out in lowercase and without commas separating them and if the j of january began in cell one, the letter r of the month march would be character number 20. In cell mode, if you read this set of characters and then move the window to the next display, cell one of the new display would contain the c of march and continue through the u of july. Cell mode is essential for examining text with precision and should be especially useful for programmers.

Word mode, (choice W) is the default. Using the list of months example, if one were to select Word mode even though the m, a and r of march could fit in the window, the system would hold them over for the next display. In the Word mode, words are not broken unless they are more than 20 letters long. This makes the reading of conventional text more comfortable. Of course, the first window of text in Word mode may break words. The system cannot know in the first display whether more text will follow and whether what it is containing is an entire word or part of a longer one. If you want to read in Word mode from the beginning of text, rock the window forth and back from the next to the previous display once and all should be well. If you need to examine text critically, you will want to leave Word mode and enter Cell mode. Also, you will want to display CTRL characters as spaces (M-chord Y) and use the R-chord C to identify specific CTRL characters. You may want to invoke one of the G-chord options for the display of carriage return characters as well.

Scroll mode (choice S) let's you do what we talked about a long time ago. It allows you to write text and have the display window follow you character for character. Using this mode, you always are able to see the last character you have written. When you enter the FIND or INSERT option you are automatically in the scroll mode. This mode remains in effect until you leave FIND or INSERT. If you don't like the noise and only want to be able to check your work from time to time, use Cell or Word mode and move the window to the end of text should you need to see your work.

Columnar mode (choice Q) allows you to limit the left and right boundaries of a line so that the PortaBraille can be made to read down a column of information or across columns but not all the way to either end of the line. If you have a column or set of columns which is greater than the 20-cell window can handle in a single trip, it will take more than one display to give you the entire column. If you set the left boundary at 17 and the right at 33, there is no problem. The first window will show you positions 17 to 33 on line one, the second will show positions 17 to 33 on line 2 etc. If you shift the right boundary over to 50, then the first and second displays will be needed to give you all of those portions of line one and the third and fourth, line two and so on.

Choice V allows you to use the PortaBraille to examine as closely as possible, the screen you have selected with the SCREEN SELECT command. For example, having selected "Apple computer with PRINT-IT! card (80 column mode) with the dots "16-chord 8" command above, you must call upon "window option V" to invoke your selection. Since video screens often contain many blank lines or portions of lines, there are times when you may find it convenient to use the "window--skip blank" command. You should do this only after you are acquainted with the make-up of the video screen and applications program with which you may be working.

CAUTION: When you invoke W-chord choice V, REMEMBER that carriage returns and all other control (CTRL) characters are not displayed. This is done to give as true a representation of screen spacing as possible within the PortaBraille display window. If you like, you may display such characters by turning on the appropriate G-chord option and selecting M-chord Y. REMEMBER! When you enter this option, the entire PortaBraille or PocketBraille buffer is emptied. Any text you have in memory is gone forever. This also happens each time you up-date your "screen display".

WINDOW ROUTING: dots 1246-chord [B, S, A]
B = braille, S = speech, A = all. At present, this means an external speech synthesizer and braille at the same time.

There are times when you may wish to connect the PortaBraille to an external speech synthesizer. Since the PocketBraille has no display at all, connection to such a speech device would give you the ability to read the contents of your text memory by listening. This command allows you to route all text window moves and all window cursor moves within the window either to the braille display, the selected output port or to both the braille display and selected port. When this command is initiated, the appropriate display device (both braille and speech if "all" is selected) will show the current window of text. If only speech is selected, the braille display window remains static until choices "B" or "A" cause it to display the current text window. The system automatically goes into "choice W" of the Window Options to make for understandable speech. When cursor moves are made within the window (dot 5-chord or dots 45-chord) the character which is voiced by a speech synthesizer is the one upon which the cursor rests. When the cursor contacts an uppercase character the speech synthesizer speaks the word "cap" followed by the name of the character. If the system is set to display control (CTRL) characters the word "control" will be spoken followed by the name of the character. If the options for the display of carriage returns and other control characters are turned off, control characters will not be voiced.

CAUTION! When text is transmitted to an external computer for storage or to a printer for braille or inkprint hard copy, if the PortaBraille system is set for speech or speech and braille, the "SENDING TEXT" message which begins a transmission from the system will be sent to the computer or printed as a part of your text. To avoid this, before transmitting data you may want to set window routing to the braille option.

WINDOW--SKIP BLANK: dots 12346-chord [Y, N]

As you advance the text window from one display to the next, there are times when you might have to pass through several sets of empty braille cells before encountering new text. This command skips through all 20-cell sets of blank spaces. This is true whether you are moving the window forward or back

through your text. The default is for this option to be active. When it is, control (CTRL) characters, including carriage returns, are not displayed as spaces. It automatically ignores them if they are surrounded by blank spaces. If you want to examine your text "microscopically", set this option to "no". (See Window Option Words Mode).

COMMUNICATIONS COMMANDS

NOTE: These commands are used to maintain serial communications between the PortaBraille and external devices. Assuming that the communications parameters here match those of the external device, there is no command you need issue to the PortaBraille in order for it to receive incoming text. If the parameters of the external device match the default values of the PortaBraille, all you need do is turn the PortaBraille on and cause the other device to start sending.

You may wish to use your PortaBraille or PocketBraille to communicate with a computer network. In such a case, you will need to learn the requirements of the network for "logging on" (signing into the system). When you are receiving incoming text, there may be times when the network will send enough information to fill the buffer (text memory) of your braille device. When this happens, the text window of the PortaBraille will show "BUFFER FULL". If either device is routed to a speech synthesizer, this same message will be spoken. However, the "BUFFER FULL" message does not come to you automatically the instant the text memory is full. The condition called "handshake" prevents additional data from entering the PortaBraille or PocketBraille. When you read through to the end of your text and try to go beyond the end with one additional advance of the display window, the message comes to you. What you must do in such a case is remove some text from your PortaBraille's memory. Having read your text you may be willing to delete it. If you wish to save it, you may do so by transmitting it to a storage device. In any case text which is removed from your system's memory makes room for an equal amount of incoming text from the remote source.

BAUD RATE: B-chord n
n = the first two digits of the desired rate:
11 = 110; 15 = 150; 30 = 300; 12 = 1,200; 18 = 1,800; 24 = 2,400; 48 = 4,800; 96 = 9,600 baud (the default);

See note at end of this section.

DATA LENGTH: X-chord[8, 7]

See note at end of this section.

DUPLEX: N-chord [H, F]
H= half, F = full

This command deserves special notice. When you write with the system set for half duplex, the default value, everything you write is stored in your text memory as well as sent out the selected output port. On the other hand, when you are in full duplex, everything you write is sent out the output port which you have selected and nothing is stored in your text memory. This is useful if you are using either the PortaBraille or PocketBraille with a speech synthesizer. Most speech synthesizers require certain commands to change from the "read words" to the "spell" mode etc. You will want to be able to command your speech box without having all these commands stored in your text memory.

If you have your PortaBraille connected to an external computer, chances are you will need to be in full duplex mode. In such a case, every character you send will be echoed back by the external device. This echoed material WILL BE STORED in your text memory.

See also the note at the end of this section.

ESCAPE SEQUENCES RECOGNIZE: dots 246-chord [N, Y]

All the commands listed here are issued from the keyboard of the PortaBraille or PocketBraille. Some of these commands can be sent from an external device as "escape sequences". In order for these commands to be obeyed, the PortaBraille must be enabled to recognize escape sequences. Since many users may never need this ability, we have chosen to make it a condition which must be turned on rather than have it as the default. Otherwise, the unsuspecting user might have all sorts of unpredictable conditions appear if the PortaBraille or PocketBraille received and recognized escape sequences.

HANDSHAKE: H-chord [S, H, N]
S = software, H = hardware, N = no handshake

See note at end of this section.

PARITY: P-chord [N, E, O]
N = none, E = even, O = odd

See note at end of this section.

STOP BITS: Y-chord [1, 2]

NOTE: All of the commands listed in this section are concerned with communication between the PortaBraille and some sort of external device. Where serial communication is employed, all of the parameters listed here must match those of the other device. They deal with such things as the speed of transmission, length of each character, recognition of end of one character and the start of the next, and the control of transmission between devices which may, due to their nature, operate at different speeds.

INTERFACING INFORMATION

The PortaBraille has two interface ports; an asynchronous RS232 serial port and a parallel port. This section provides detailed information on these ports to allow you to connect the PortaBraille to any other device having one of these two types of interfaces.

The RS232 port terminates on the rear of the unit at a standard DB25S 25-pin female connector. Only five pins within this connector are used by the PortaBraille. They are: Pin 2 = Transmitted Data, Pin 3 = Received Data, Pin 7 = Ground, Pin 6 = Data Terminal Ready (DTR), & Pin 20 = Data Set Ready (DSR). Data transmitted from the PortaBraille goes out through pin 2 while data coming into the PortaBraille enters through pin 3. Pins 6 & 20 are active only when hardware handshaking is enabled. In this case pin 20, the DTR output, indicates to the remote device that the PortaBraille is ready to receive data. If the PortaBraille's buffer becomes full, the DTR line will go low thereby requesting the remote system to stop sending data. Pin 6, the DSR input, is checked by the PortaBraille's firmware before transmitting each character. If the line is low it means the remote device is not ready and the PortaBraille will wait until the line goes high before sending the character.

Voltage levels are within the RS232 standard specifications. Default parameters after power-up are 9600 baud, 8 data bits, 1 stop bit, and no parity. Of cource, any of these may be changed by user command.

The Centronics compatible parallel port terminates on the rear of the unit at a standard 36-pin female CHAMP connector. The user can command this port to be an input or an output. The default configuration after power-up is an input port. This means the PortaBraille's interface is identical to most ink printers with parallel interfaces. For example, the PortaBraille could be directly connected to the parallel printer cable from an IBM PC and begin receiving data. Pinouts conform to the Centronics standard. They are: Pin 2 through Pin 9 = D0 through D7, Pin 1 = Strobe, Pin 10 = Acknowledge, Pin 11 = Busy, Pin 19 = Ground. Three other pins not applicable to the PortaBraille are terminated anyway in case the host checks them. They are : Pin 13 = Select (tied high), Pin 32 = Error(tied high), and Pin 12 = Paper Empty (tied low).

If the user commands the parallel port to be an output port then a cable adapter must be inserted between the PortaBraille and the standard parallel cable. This male/female adapter should connect only the following lines: 1. Connect pins 2 through 9 and pin 19 straight through the adapter; 2. Swap pins 1 to 10 and 10 to 1. Do not connect any other lines through the adapter. Of course, a special cable rather than an adapter could be built if desired but that cable could not be used with the port configured as an input.

Both the serial and parallel ports are always active unless one or the other is disabled by user command. This allows for great I/O flexibility and potentially interesting applications by connecting two peripheral devices to the PortaBraille at the same time. One example might be receiving data from a host on the serial port wile driving a speech box with the parallel port. Let us know about any unique and useful applications you may encounter.

OTHER COMMANDS

ABORT: dots 36-chord

This command aborts the transmission of data and releases the handshake line in the event of a "handshake hang-up".

KEYBOARD ACTIVE: K-chord [Y, N]

When you turn on your PortaBraille, it is ready to write immediately. The keyboard is active. There are times when you may want to make the keyboard inactive so that accidental key strokes are not made a part of your text. This is the command you use to do it.

LINEFEED APPEND IN TRANSMIT: J-chord [N, Y]

As you write text there will be times when you need to enter carriage return characters. If this text is transmitted to an external device such as a printer and if that printer is not set to append a linefeed when it receives a carriage return, all your printing will be done on one line. This command lets you append a linefeed in the transmit mode to take care of such situations.

CAUTION: If you have received text from another source and are retransmitting this text, if the text contains carriage return/linefeed pairs, having this command in use will cause an additional linefeed to be appended for each

carriage return.

OUTPUT LINE LENGTH: S-chord N E-chord
n = 1, 2 or 3 digits (255 max)

As you write, you need not keep up with the length of every line of text. If you want to drive an ink or braille printer, use this command to determine the length of each printed line. Braille lines will be shorter than inkprint lines. When the system sees the value of line length you have set, it will force a carriage return at or below that value so that words will not be broken. The use of this command has no effect on insertion, deletion, or window movement based on numbers of lines. The default is 0, meaning that no "forced" carriage returns are issued unless you specify a line length.

OUTPUT PORT SELECT: O-chord [S, P, B, N]
S = serial port, P = parallel port, B = both ports, N = no output port selected

When you turn on your system, output goes to the serial port. This command lets you select either serial, parallel, both ports or no ports. Normally, the parallel port is an input port only. If you select either both ports (B) or parallel port (P) for output, you will need to obtain a simple cable adapter to configure the parallel port as an output port. (See "INTERFACING INFORMATION".)

RESET--WARM: dots 123456-chord dots 123456-chord

This command allows you to return all PortaBraille or PocketBraille parameters to their default values without the loss of data from text memory. Those who acumulate data by downloading from computer networks might find this command especially useful.

CAUTION: This command should not be used within another command or when data are being transmitted or received.

SELF TEST: hold down dot 2 as power is turned on

When you use this option, the first element of the cycle is the top row of braille dots, dots 1 and 4. They disappear and are replaced by dots 2 and 5. Then, the bottom row of dots appears. It is replaced with a set of full cells. The cycle ends with a set of spaces. Turn the unit off to end the test.

TRANSMIT TEXT: T-chord [L, P, Z]
L = line, P = paragraph, Z = all from current window cursor location to end of text.

This is the command to use in sending data from your system to an ink or braille printer, a modem or an external computer. Transmission takes place through the output port which you have selected. (See Output Port Select.) When text is being transmitted the message "SENDING TEXT" appears in the braille window until the transmission is complete. When WINDOW ROUTING is set to speech the message is voiced once. It also is printed if you have a printer connected to a selected output port. For information concerning a way around this condition, see the section on Window Routing.

COMMAND SUMMARY

The letters "ctrl" stand for the "control character". [Y, N] means "yes, no".

A "chord" means the use of the space bar and other keys simultaneously.

ABORT: dots 36-chord

APPEND: always active appends data to end of text unless in insert mode

BACKSPACE: dot 2-chord

BAUD RATE: B-chord n
n = the first two digits of the desired rate:
11 = 110; 15 = 150; 30 = 300; 12 = 1,200; 18 = 1,800; 24 = 2,400; 48 = 4,800; 96 = 9,600 baud (default);

CARRIAGE RETURN/LINEFEED PAIR: dots 46-chord

CARRIAGE RETURNS DISPLAY AS: G-chord [S, F, 4, N]
S = spaces, F = full cell, 4 = dot 4, N = do not display

CTRL CHARACTER FOLLOWS: dot 4-chord

CTRL CHARACTERS OTHER THAN CARRIAGE RETURNS DISPLAY AS SPACES: M-chord [Y, N]

DATA LENGTH: X-chord[8, 7]

DELETE: D-chord [C, W, L, P, Z] followed by up to a three digit number (255 max) E-chord
C = character, W = word, L = line, P = paragraph, Z = all from current window cursor location to end of text

DUPLEX: N-chord [H, F]
H= half, F =full

ESCAPE SEQUENCES RECOGNIZE: dots 246-chord [N, Y]

FIND: F-chord string (255 character max) E-chord

FIND INCLUDING CASE: dots 2346-chord [N, Y]

HANDSHAKE: H-chord [S, H, N]
S = software, H = hardware, N = no handshake

INSERT: I-chord text E-chord
(255 characters max)
(backspace allowed in insert for immediate correction)

KEYBOARD ACTIVE: K-chord [Y, N]

LINEFEED APPEND IN TRANSMIT: J-chord [N, Y]

MOVE WINDOW CURSOR TO LEFT ONE CHARACTER: dots 45-chord

MOVE WINDOW CURSOR TO RIGHT ONE CHARACTER: dot 5-chord

MOVE WINDOW FORWARD OR BACKWARD n LINES: #-chord + or - n E-chord
n = number of lines, up to 255; - before the number moves back, no indicator or a plus sign moves forward

MOVE WINDOW TO BEGINNING OF TEXT: A-chord

MOVE WINDOW TO END OF TEXT: Z-chord

MOVE WINDOW TO NEXT DISPLAY: dot 6-chord

MOVE WINDOW TO NEXT LINE: dots 56-chord

MOVE WINDOW TO NEXT PARAGRAPH: dots 456-chord

MOVE WINDOW TO PREVIOUS DISPLAY: dot 3-chord

MOVE WINDOW TO PREVIOUS LINE: dots 23-chord

MOVE WINDOW TO PREVIOUS PARAGRAPH: dots 123-chord

OUTPUT LINE LENGTH: S-chord N E-chord
n = 1, 2 or 3 digit number (255 max)

OUTPUT PORT SELECT: O-chord [S, P, B, N]
S = serial port, P = parallel port, B = both ports, N = no output port selected

PARITY: P-chord [N, E, O]
N = none, E = even, O = odd

RESET--WARM: dots 123456-chord dots 123456-chord (tap any key to return window to normal.)

SCREEN SELECT: dots 16-chord [I, R, 8, 4]
I = IBM PC, R = Radio Shack Model 100, 8 = Apple computer with PRINT-IT! card (80 column mode), 4 = Apple computer with PRINT-IT! card, (40 column left justified mode)

SELF TEST: hold down dot 2 as power is turned on. Turn unit off to end.

SHOW WINDOW WITH CTRL CHARACTERS: R-chord C (tap any key to return window to normal)

SHOW WINDOW WITH FREE MEMORY: dots 156-chord. (Tap any key to return window to normal.)

SHOW WINDOW WITH FIRMWARE VERSION NUMBER: V-chord (Tap any key to return window to normal)

SHOW WINDOW WITH UPPERCASE CHARACTERS: R-chord U (tap any key to return window to normal)

STOP BITS: Y-chord [1, 2]

TRANSMIT TEXT: T-chord [L, P, Z]
L = line, P = paragraph, Z = all from current window cursor location to end of text

UPPERCASE--LOCK ON: U-chord U-chord

UPPERCASE--NEXT CHARACTER ONLY: U-chord

UPPERCASE--UNLOCK: 0-chord

WINDOW OPTIONS: W-chord [C, W, S, V, Q]
C = cell, W = word, S = scroll, V = Selected Screen, Q = column mode
To read columnar text, enter W-chord Q followed by a 1, 2 or 3 digit number, (255 max) followed by a comma and another 1, 2 or 3 digit number. The command is terminated with an E-chord.

WINDOW ROUTING: dots 1246-chord [B, S, A]
B = braille, S = speech, A = all, braille and speech

WINDOW--SKIP BLANK: dots 12346-chord [Y, N]

ESCAPE SEQUENCES

In the following listing, the abbreviation "ESC" means "escape".

BUFFER (AND DISPLAY) CLEAR: ESC D

BUFFER (BUT NOT DISPLAY) CLEAR: ESC d

CARRIAGE RETURNS DISPLAY AS: ESC G [S, F, 4, N]
S = space, F = full cell, 4 = dot 4, N = do not display

CTRL CHARACTERS OTHER THAN CARRIAGE RETURNS DISPLAY AS SPACES: ESC M [Y, N]

DUPLEX: ESC N [H, F]
H = Half, F = Full

FIND: ESC F string ESC E

HANDSHAKE: ESC H [S, H, N]
S = software, H = hardware, N = no handshake.

INSERT: ESC I string ESC E

KEYBOARD LOCK: ESC K [Y, N]

LINEFEED APPEND IN TRANSMIT: ESC J [N, Y]

MOVE WINDOW TO NEXT DISPLAY: ESC +

MOVE WINDOW TO NEXT LINE: ESC >

MOVE WINDOW TO NEXT PARAGRAPH: ESC]

MOVE WINDOW TO END OF TEXT: ESC Z

MOVE WINDOW TO PREVIOUS DISPLAY: ESC -

MOVE WINDOW TO PREVIOUS LINE: ESC <

MOVE WINDOW TO PREVIOUS PARAGRAPH: ESC [

MOVE WINDOW TO BEGINNING OF TEXT: ESC A

OUTPUT PORT SELECT: ESC O [S, P, B, N]
S = serial port, P = parallel port, B = both ports selected, N = none selected.

SCREEN SELECT: ESC V [I, R, 8, 4]
I = IBM PC, R = Radio Shack Model 100, 8 = Apple computer with PRINT-IT! card (80 column mode), 4 = Apple computer with PRINT-IT! card (40 column left justified mode)]

TRANSMIT TEXT: ESC T [L, P, Z]
L = line, P = paragraph, Z = all from current window cursor location to end of text.

WINDOW OPTIONS: ESC W [C, Q, S, V, W]
C= Cell, Q = Read Columns, S = Scroll, V = Selected screen, W = Word

DEFAULT VALUES

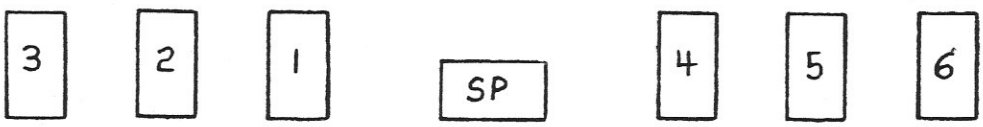
APPEND: always active
BAUD RATE: 9600
CARRIAGE RETURNS DISPLAYED AS: spaces
CASE: lower
COMMANDS REQUIRING NUMBERS: 1 if none given (except output line length = 0)
CTRL CHARACTERS DISPLAYED AS: spaces
DATA LENGTH: 8
DUPLEX: half
ESCAPE SEQUENCES RECOGNIZE: no
FIND INCLUDING CASE: no
HANDSHAKE: software
KEYBOARD ACTIVE: yes
LINEFEED APPEND IN TRANSMIT: no
OUTPUT LINE LENGTH: 0 (= no maximum length)
OUTPUT PORT SELECT: serial
PARITY: none
STOP BITS: 1
SCREEN SELECT: IBM PC
WINDOW OPTION: word
WINDOW ROUTING: braille
WINDOW--SKIP BLANK: yes

ASCII TO BRAILLE CONVERSION CHART

(For Individuals Handicapped with Sight)

ASCII CHAR	BRAILLE DOTS
Space	(no dots)
!	2,3,4,6
"	5
#	3,4,5,6
$	1,2,4,6
%	1,4,6
&	1,2,3,4,6
'	3
(	1,2,3,5,6
)	2,3,4,5,6
*	1,6
+	3,4,6
,	6
-	3,6
.	4,6
/	3,4
0	3,5,6
1	2
2	2,3
3	2,5
4	2,5,6
5	2,6
6	2,3,5
7	2,3,5,6
8	2,3,6
9	3,5
:	1,5,6
;	5,6
<	1,2,6
=	1,2,3,4,5,6
>	3,4,5
?	1,4,5,6

UPPER CASE	LOWER CASE	CONTROL CHAR	BRAILLE DOTS
@	`	NUL	4
A	a	SOH	1
B	b	STX	1,2
C	c	ETX	1,4
D	d	EOT	1,4,5
E	e	ENQ	1,5
F	f	ACK	1,2,4
G	g	BEL	1,2,4,5
H	h	BS	1,2,5
I	i	HT	2,4
J	j	LF	2,4,5
K	k	VT	1,3
L	l	FF	1,2,3
M	m	CR	1,3,4
N	n	SO	1,3,4,5
O	o	SI	1,3,5
P	p	DLE	1,2,3,4
Q	q	DC1	1,2,3,4,5
R	r	DC2	1,2,3,5
S	s	DC3	2,3,4
T	t	DC4	2,3,4,5
U	u	NAK	1,3,6
V	v	SYN	1,2,3,6
W	w	ETB	2,4,5,6
X	x	CAN	1,3,4,6
Y	y	EM	1,3,4,5,6
Z	z	SUB	1,3,5,6
[	{	ESC	2,4,6
\	|	FS	1,2,5,6
]	}	GS	1,2,4,5,6
^	~	RS	4,5
_	DEL	US	4,5,6



BRAILLE KEYBOARD LAYOUT

CASSETTE RECORDED
AND BRAILLE EDITIONS
OF USER'S GUIDE

This user's guide is available on an audio cassette. This edition contains the reading of the entire text of the print edition. In addition, there is a summary of commands in braille together with a full listing of the computer braille code.

Cost of the cassette edition is $3.00. Please make check payable to: Kentucky State Treasurer - Dept. for the Blind. Send it to our address contained in the manual.

If you would like a copy of the manual in braille, the price will be $8.00. Make checks payable to same source as for cassette edition.

If you would like the manual on computer disk, contact us for a possible arrangement.

Fred Gissoni